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The 'New Safety' – Is it Really That New?




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Outline

- Background:
  - Lots going on in world of safety ('interesting times')
  - Personal view (patient safety, construction, marine, rail, nuclear ..)
  - Editing and reviewing (*Applied Ergonomics, Policy and Practice in Health and Safety*)
- What is the 'new safety' – origins and components
- Some issues
  - Forgetting the past
  - Evidence, data, theory
  - Research and practice gaps
  - We've only gone so far with 'old safety'
- Current work and summary

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What is the 'New Safety'?

- **Loose collection of ideas, concepts, constructs, methods …. theories?**
  - **Safety I vs. Safety II (Hollnagel), 'Work as done' vs. 'work as imagined' (Wears), Safety Differently (John Green, Steve Shorrock UK and others), Human Error – the new look (Woods, Cook et al.)**
  - **Drift into failure, 'Just Culture' (Dekker)**
  - **Resilience engineering (Hollnagel et al.)**
  - **Vision zero, zero harm (Zwetsloot et al.)**
  - **STAMP (Leveson), FRAM (Hollnagel)**
  - **Second order Cybernetics (Ashby, Beer and the VSM ….)***

***Special Issue of *Applied Ergonomics* on 'Quantifying Complex, Dynamic Systems: The Cybernetic Return':**
https://www.journals.elsevier.com/applied-ergonomics/call-for-papers/special-issue-on-quantifying-complex-dynamic-systems-the-cyb

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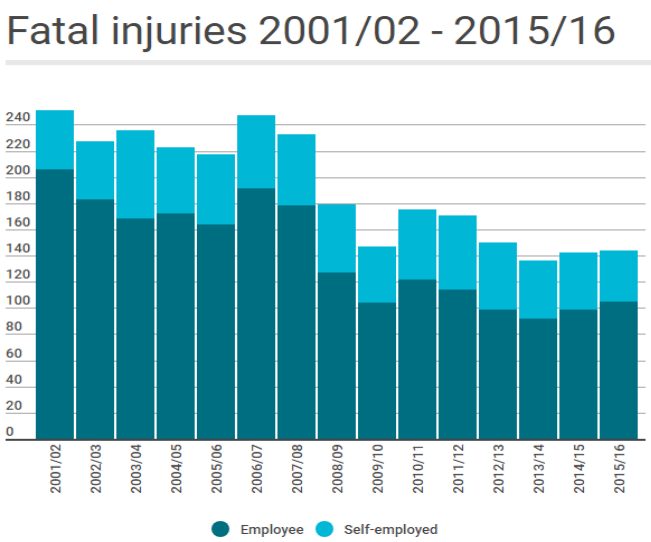
'New Safety' – Motivation and Origins

- **Much of it promoted by a dissatisfaction with progress, need for new ideas – excitement, new blood, beyond 'Swiss Cheese' etc**
- **Retrospective vs. prospective accounts of accidents**
- **'Normalisation of error'; Empowering managers and workers ('Safety intelligence' – Fruhen, Flin)**

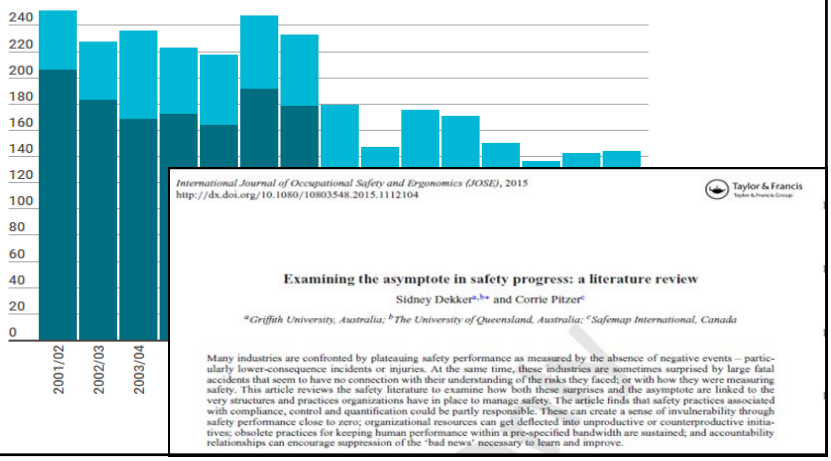
	OLD	NEW
Definition/ Focus	Ensuring as "few things go wrong as possible"	Ensuring as "many things as possible go right"
Safety Management Principle	Reactive Approach	Proactive Approach
Risk Management Approach	Identify causes, contributory factors and constrain performance, by reinforcing compliance and eliminating variability	Understand conditions where performance variability can become difficult to monitor and control
View of "Human Role"	Predominantly a liability or hazard	Necessary resource for system functioning
Foundations	Systems are decomposable, Functioning is bimodal, Work-as-imagined	Performance is variable, Performance adjustments are essential, Work-as-done
Mechanisms	Causality Credo, Linear causation models	Emergent
Manifestation	Occurrence of accidents or recognised risks	All possible outcomes
Example of Models	Swiss cheese model	Resilience
Example of Tools	Root cause analysis	FRAM

Workplace Safety – low risk/low hazard

Origins - The ‘Safety Plateau‘ – HSE, 2015



Origins - The ‘Safety Plateau‘ – HSE, 2015



International Journal of Occupational Safety and Ergonomics (JOSE), 2015
http://dx.doi.org/10.1080/10803548.2015.1112104

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Examining the asymptote in safety progress: a literature review

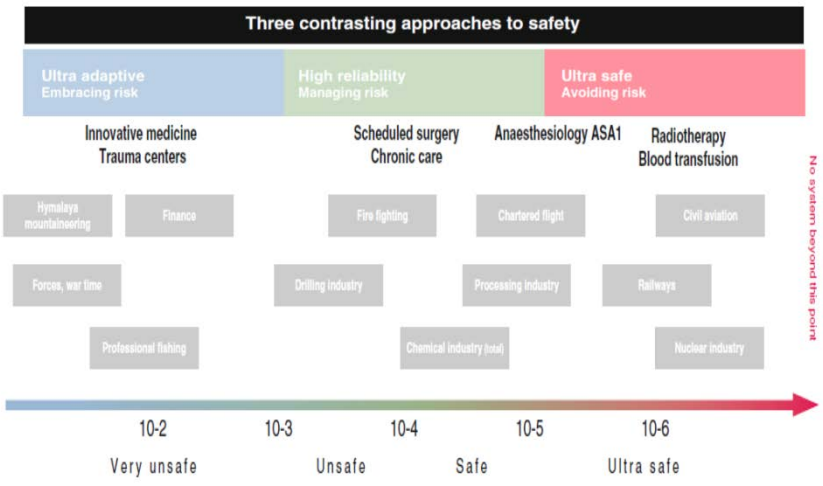
Sidney Dekker[a,b]* and Corrie Pitzer[c]

[a]*Griffith University, Australia;* [b]*The University of Queensland, Australia;* [c]*Safemap International, Canada*

Many industries are confronted by plateauing safety performance as measured by the absence of negative events – particularly lower-consequence incidents or injuries. At the same time, these industries are sometimes surprised by large fatal accidents that seem to have no connection with their understanding of the risks they faced; or with how they were measuring safety. This article reviews the safety literature to examine how both these surprises and the asymptote are linked to the very structures and practices organizations have in place to manage safety. The article finds that safety practices associated with compliance, control and quantification could be partly responsible. These can create a sense of invulnerability through safety performance close to zero; organizational resources can get deflected into unproductive or counterproductive initiatives; obsolete practices for keeping human performance within a pre-specified bandwidth are sustained; and accountability relationships can encourage suppression of the ‘bad news’ necessary to learn and improve.

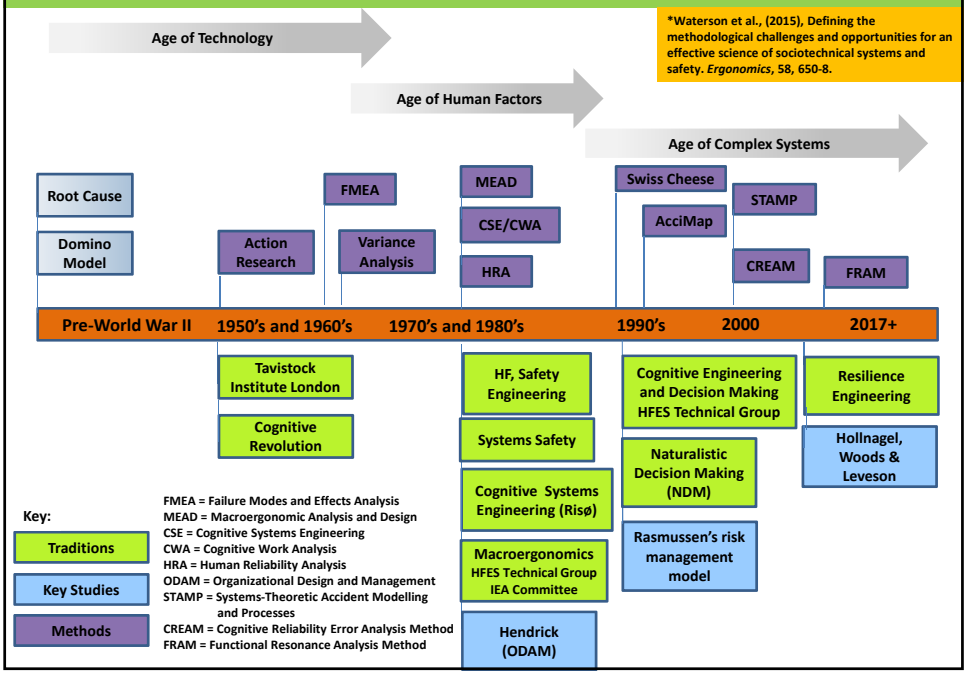
System Safety – high risk/high hazard

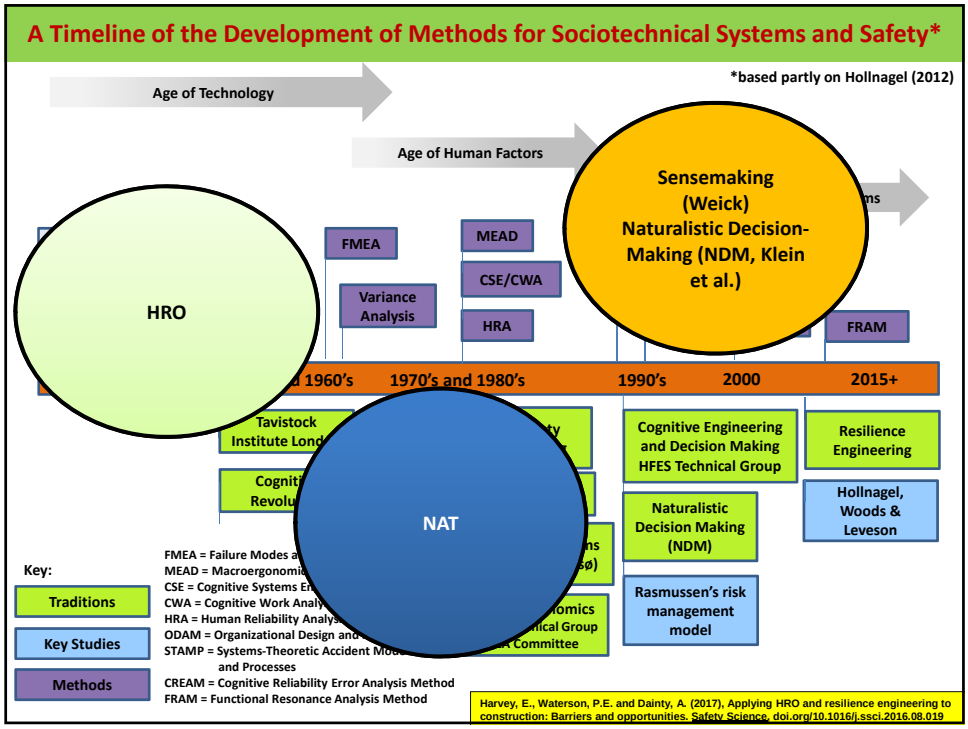
Origins – Paradox of Almost Totally Safe Systems (René Amalberti)



Vincent, C., & Amalberti, R. (2016). Safer healthcare. *Cham: Springer International Publishing*
http://www.fadq.org/wp-content/uploads/2016/02/Strategies_Real_Worldd.pdf

A Timeline of the Development of Methods for Complex Systems and Safety*





So What's so Wrong about New Ideas, the 'New Safety'?

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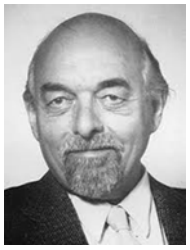
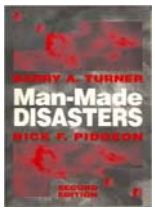
Review of the Accident Literature (Hale and Hale, 1972) ->

We forget the past



1.2.2 The term "human error" is of no help in accident prevention because although it may indicate WHERE in the system a breakdown occurs, it provides no guidance as to WHY it occurs. An error attributed to humans in the system may have been design-induced or stimulated by inadequate training, badly designed procedures or the poor concept or layout of checklists or manuals. Further, the term "human error" allows concealment of the underlying factors which must be brought to the fore if accidents are to be prevented. In fact, contemporary safety-thinking argues that human error should be the starting point rather than the stop-rule in accident investigation and prevention.

ICAO Doc 9683, written in 1992...



1978 (1st Ed.)

1989

Waterson, P.E., Le Coze, J-C and Boje-Andersen, H. (2017), Recurring themes in the legacy of Jens Rasmussen. Applied Ergonomics, 59, Part B, 471-482.

Evidence, data, theory…

- Very little empirical evidence (so far)
- Quite a lot of talk, some of it rhetorical?
- Compare this with the volume of material we have from traditional and more recent ways of looking at safety (human error taxonomies, HRA, safety culture)
- May change – Dekker (Woolworths, Australia; Wears, USA)
- STAMP, FRAM – many applications (how many by non-academics?)
- Need to synthesize ideas, concepts (HRO, NAT…)

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Research and practice gaps

- Many safety practitioners are interested in new ideas (e.g., Safety II), but also frustrated - how does it apply to me and my workplace?)
- Some misconceptions (researchers and practice) – e.g., Vision Zero
- Some existing things work well (Swiss Cheese, fault trees, timelines – UK RAIB)
- We don't know that much about practice! (e.g., the role of safety practitioners in real practice and why they succeed or fail in their role of enacting change and improvement (Andrew Hale)

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POLICY AND PRACTICE IN HEALTH AND SAFETY, 2016
VOL. 14, NO. 2, 97–98
http://dx.doi.org/10.1080/14773996.2016.1261814

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EDITORIAL

Bridging the gap between research, policy and practice in health and safety

This issue of the journal represents the second one since I took over as Editor-in-Chief of *Policy and Practice in Health and Safety* (PPHS) at the beginning of 2016. Some readers will have noticed some

We've only gone so far with 'old safety'

- Safety culture – 'science' is still immature (patient safety)
- The role of the regulator and safety culture
- Case studies of how safety culture unfolds in companies and sectors
- Evaluation studies of interventions aimed at improving safety (longitudinal studies of how improvement processes operate and are sustained over time)
- Comparative studies across nations
- Using "big data" to monitor/predict safety performance
- Failure to learn (Haddon-Cave, Morecambe Bay NHS)

Contents lists available at ScienceDirect
Safety Science
journal homepage: www.elsevier.com/locate/ssci

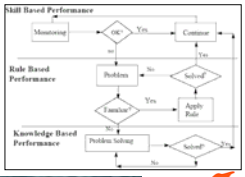
HRO and RE: A pragmatic perspective

Torgeir K. Haavik [a,*], Stian Antonsen [b], Ragnar Rosness [b], Andrew Hale [c,d]

"There are no approaches in safety science that capture into one theory or model everything that explains why and how failures and successes are achieved'
Haavik et al., (2017, in press)

Current work (something old, something new …)

- Early warnings, red flags, weak signals, ‚glitches' vs ‚mistakes', vibes, hunches ….
- What triggers feeling that something is wrong? How to spot these and act early on them?
- Anticipating failure (what are the 'weak/strong signals' – Carl Macrae)
- Chronic unease and safety intelligence amongst Construction Managers
- Safety Culture – Maturity Models (Critical Review)*



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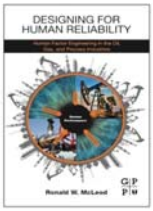
Filho, A.P.G. and Waterson, P.E. (submitted), Maturity models and safety culture: a critical review. Safety Science

Current work (something old, something new …)

- Implications of Kahneman and Gigerenzer's work on risk and decision-making for safety (Ron McLeod)
- Fundamental review of accident analysis and investigation*
- 'The Problem with Safety Culture'**
- Use of systemic accident models (Accimap, STAMP)

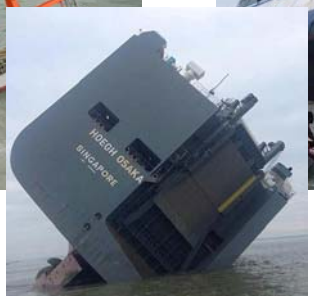


*Waterson, P.E., Ryan, B., Braithwaite, G., Young, M.S. and Johnson, C.W. (in prep), Human factors and accident investigation/analysis: a fundamental review. Applied Ergonomics
**Waterson, P.E., Reader, T.W. and Shorrock, S. (in prep), The problem with safety culture. BMJ: Quality and Safety

Simon Murray

Improving Safety Performance in the Commercial Shipping Industry

Some 2015 Headlines!

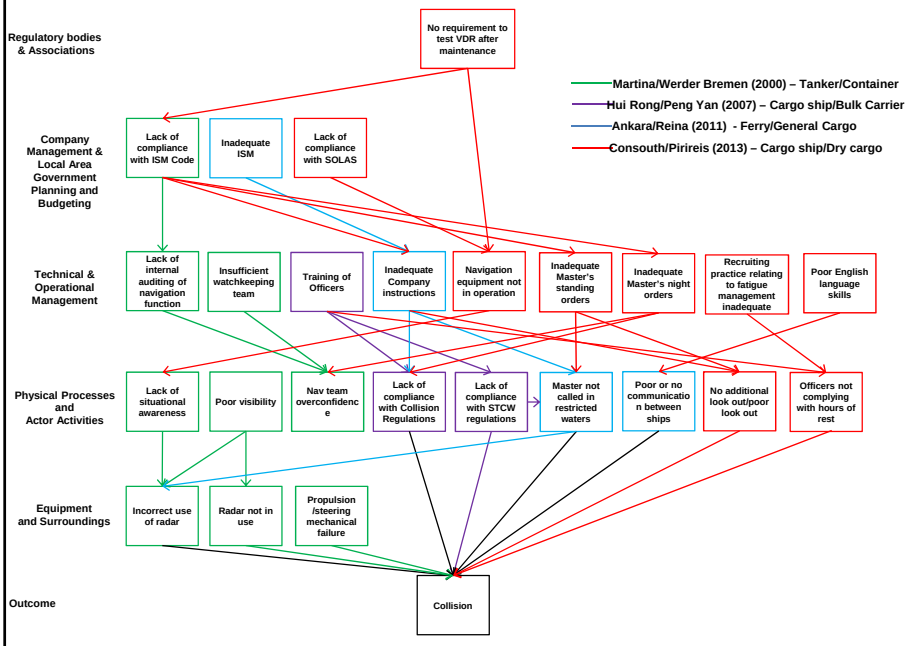


Abandon Ship!

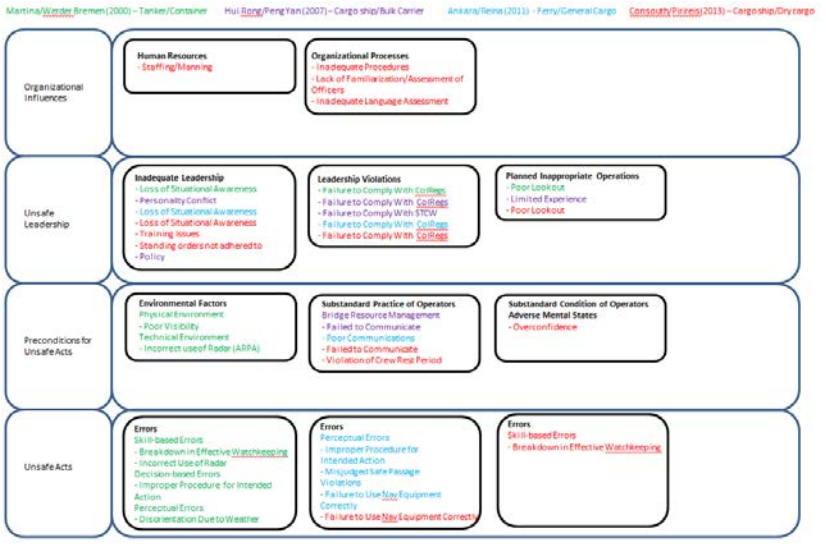
'Too early' to say why she went aground

Murray, S., Jun, G.T. and Waterson, P.E. (in prep), Collisions at sea: A systemic accident analysis of casual factors and countermeasures. Safety Science

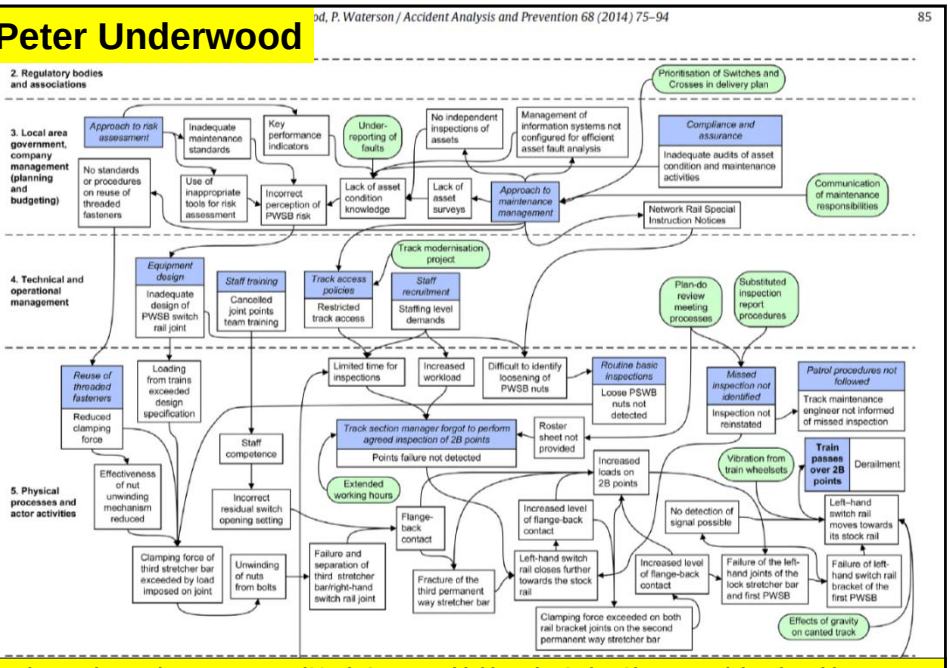
ACCIMAP of Four Serious Collisions



HFACS Analysis



Peter Underwood



Underwood, P. and Waterson, P.E. (2014), Systems thinking, the Swiss Cheese model and accident analysis: a comparative systems analysis of the Grayrigg train derailment using the ATSB, Accimap and STAMP models. Accident Analysis and Prevention, 68, 75-94.

Animation Production for Public Engagement

Two Contrasting Views of the South Korea Ferry Accident

https://vimeo.com/122851457

Kee, D., Jun, G.T., Waterson, P.E. and Haslam, R.H. (2017), A systemic analysis of the South Korea Sewol ferry disaster - striking a balance between learning and accountability. Applied Ergonomics, 59, Part B, 504-516.

Summary

- Many exciting developments
- Rather than seeing them as in opposition, view them ('pragmatically') as complementary
- Lots of work there out to be done (not least in terms of theory)
- Let's move away from slogans
- Synthesis work, but please don't forget practice!
- A final thought

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We live in interesting times .. But …

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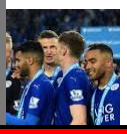

Thanks for Your Attention!

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